

CLAIMS

1. A piezoelectric element comprising a first electrode, a second electrode and a lead compound-containing piezoelectric body sandwiched between the first and second electrodes, wherein

the piezoelectric body is made of an aggregate of a plurality of crystals,

zirconium oxide exists at a grain boundary between the crystals and zirconium element exists at the grain boundary in a larger composition ratio than lead element.

2. A piezoelectric element according to claim 1, wherein

the piezoelectric body is made of an aggregate of a plurality of columnar crystals which are oriented from one end to the other of the piezoelectric body in the thickness direction thereof.

3. A piezoelectric element according to claim 1, wherein

the piezoelectric body contains at least zirconium element, titanium element, lead element and oxygen element.

4. An inkjet head comprising: a head body including a nozzle and a pressure chamber which is communicated with the nozzle and contains ink; and a piezoelectric element which is arranged to face the pressure chamber at part of one of its surfaces intersecting the thickness direction of the piezoelectric element and applies a pressure to the ink in the pressure chamber such that the ink is discharged from the nozzle to a recording medium, wherein

the piezoelectric element includes a first electrode, a second electrode and a lead

compound-containing piezoelectric body sandwiched between the first and second electrodes,

the piezoelectric body is made of an aggregate of a plurality of crystals,

zirconium oxide exists at a grain boundary between the crystals and zirconium
5 element exists at the grain boundary in a larger composition ratio than lead element.

5. A method for manufacturing a piezoelectric element comprising a first electrode, a second electrode and a lead compound-containing piezoelectric body sandwiched between the first and second electrodes, the method comprising the steps of:

10 stacking the first electrode, the piezoelectric body and the second electrode in this order; and

exposing at least one of the first and second electrodes to a chemical substance containing at least one of zirconium alkoxide, zirconium acetyl acetate and zirconium carboxylate after the stacking step.

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6. A method according to claim 5, wherein
the chemical substance used in the exposure step is in a liquid state.

7. A method according to claim 5, wherein
20 the chemical substance used in the exposure step is in a gaseous state.

8. A method according to claim 5, wherein
the chemical substance used in the exposure step is dissolved in an organic solvent.

25 9. A method according to claim 5, wherein

a voltage is applied across the first and second electrodes in the exposure step.

10. A method according to claim 5 further comprising the step of thermally treating the piezoelectric element at 100°C or higher after the exposure step.

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11. A method according to claim 5, wherein
the stacking step comprises the step of stacking the piezoelectric body on the first electrode by vacuum sputtering.

10 12. A method for manufacturing an inkjet head comprising: a head body including a nozzle and a pressure chamber which is communicated with the nozzle and contains ink; and a piezoelectric element which is arranged to face the pressure chamber at part of one of its surfaces intersecting the thickness direction of the piezoelectric element and applies a pressure to the ink in the pressure chamber such that the ink is discharged from the nozzle
15 to a recording medium, wherein the piezoelectric element comprises a first electrode, a second electrode and a lead compound-containing piezoelectric body sandwiched between the first and second electrodes, the method comprising the steps of:

stacking the first electrode, the piezoelectric body and the second electrode in this order; and

20 exposing at least one of the first and second electrodes to a chemical substance containing at least one of zirconium alkoxide, zirconium acetyl acetonate and zirconium carboxylate after the stacking step.